

## CASE REPORT

**Stridor Post-Pneumonectomy - “The Post-pneumonectomy Syndrome”**

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**Abstract:**

We report a case of a 33 year old lady who presented to our department with complaints of breathlessness and stridor. On enquiry she gave history of right pneumonectomy for right main bronchus carcinoid 15 years ago. Chest X-ray as initial investigation showed homogenous opacity in right hemithorax with mediastinal shift to right. Computed tomography of thorax showed post-pneumonectomy status with left lower lobe bronchus compression between the aorta and main pulmonary artery with post obstructive overinflation of left lower lobe. Spirometry was suggestive of an obstructive abnormality. Diagnosis of post-pneumonectomy syndrome was made and patient was treated with inhaled corticosteroids and inhaled long acting beta2 agonist.

**Keywords:** Pneumonectomy, Mediastinal Repositioning, Bronchial Stenting

**Introduction:**

Post Pneumonectomy Syndrome (PPS) is a rare condition that is characterized by dyspnea resulting from an extreme mediastinal shift and bronchial compression of the residual lung following surgical pneumonectomy [1]. It is a rare complication that can occur months to years following a pneumonectomy and more frequently in younger people.

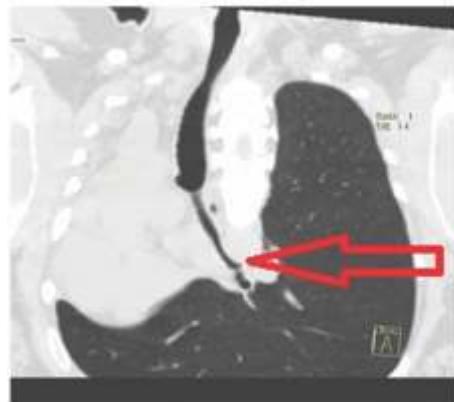
**Case Report:**

A 33 year old lady presented with complaints of severe breathlessness and stridor. She also gave history of cough with mucoid expectoration and exertional dyspnoea since 6-7 years. On enquiry, she described a history of right pneumonectomy

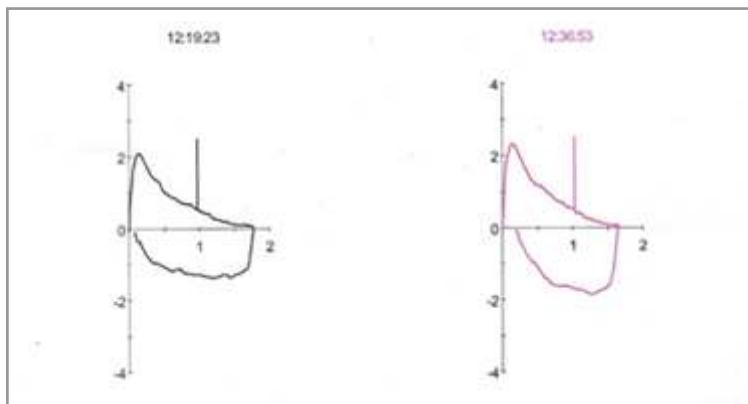
done 15 years back for carcinoid in right main-stem bronchus. On physical examination, there were signs of volume loss in the right hemithorax with tracheal shift to right, apex impulse shifted to the left parasternal fifth intercostal space. There was shoulder droop on right side, decreased spinoscapular distance of the right hemithorax, the right heart border was in a right parasternal location. There was an absence of breath sounds in the right hemithorax. Baseline blood investigations were normal with haemoglobin of 12.2 gm%, white blood count of 6800/cmm, fasting blood sugar of 96 gm%, blood urea nitrogen of 11 mg/dl, and serum creatinine of 0.7 mg%. Electrocardiogram showed T-wave flattening. The postero-anterior X-ray view of the chest showed homogenous opacity in right hemithorax with mediastinal shift to right (Fig. 1). High resolution computed tomography was suggestive of right pneumonectomy status with an irregularly marginated bronchial stem and compensatory hyperinflation of left lung with shift of the mediastinum to right. As a result of the shift, the lower lobe bronchus showed greater than 80% narrowing at its origin, compressed between aorta and the pulmonary artery. Reconstruction images were suggestive of compression of the distal most portion of left main bronchus between the aorta and main pulmonary artery with post obstructive overinflation of left lower lobe (Fig. 2). Pulmonary function test was suggestive of obstructive abnormality with FVC of 60%, FEV1 of 48% and FEV1/FVC ratio of 56%. The flow volume loop



**Fig. 1:** Chest X-Ray Postero-Anterior View Showing a Homogenous Opacity in Right Hemithorax with Mediastinal Shift to Right



**Fig. 2:** Reconstruction Image of Computed Tomography Thorax Showing Left Lower Lobe Bronchus Narrowing (Red Arrow) with Over-inflation of the Left Lung



**Fig. 3:** Pulmonary Function Test Flow Volume Loop Showing Scalloping of the Linear Portion of the Expiratory Flow Suggesting an Obstructive Pattern

showed scalloping of the linear portion of the expiratory flow suggesting an obstructive pattern (Fig. 3).

#### Diagnosis:

Based on the clinico-radiological correlation with history of right pneumonectomy in the past, we arrived at the diagnosis of PPS. The patient was advised to undergo surgical repositioning of mediastinum but denied the same. She was treated with Inhaled Corticosteroids (ICS) and Long Acting Beta-2 Agonist (LABA). She improved

symptomatically on follow up with decreased cough and dyspnea.

#### Discussion:

PPS is rare entity with an incidence of approximately one in 640 cases post-pneumonectomy [2]. Wassermann *et al.* (1979), first used the term PPS [3], though the first report of tracheobronchial compression after a pneumonectomy was of a 6-year-old boy in 1972 [4]. The increased incidence observed in infants, young children, and young women (as in our case) compared to older patients

and men is postulated to be related to the latter having increased elasticity and compliance of their lungs and mediastinum. PPS is more common after a right pneumonectomy, as is in our case, due to several anatomic factors. The right lung volume is more than the left, hence right pneumonectomy results in a greater mediastinal shift toward the right side with the heart being displaced into the right hemithorax and increased chances of compression between the mediastinal structures. The left main bronchus is prone to compression as it is stretched and pushed down by the left aortic arch and is then compressed inferiorly between the left pulmonary artery and the descending aorta [5]. Patients generally present with complaints of dyspnea on exertion and stridor which slowly progresses over years, sometimes leading to respiratory failure.

Diagnosis may be based on computed tomography, bronchoscopy and pulmonary function tests after excluding commoner complications [6]. Surgical

management with thoracotomy for repositioning of the mediastinum and prosthesis insertion is the best treatment modality, if the patient is symptomatic. This surgery provides immediate and lasting symptomatic relief to patients with PPS [7]. Bronchial resection, division and bypass of the aorta, or spine resection have been attempted, however the post-operative mortality following these procedures was exceedingly high. In cases where surgery is not feasible, bronchoscopically guided endobronchial stent placement has been documented in the literature [8]. Being a rare complication and a mechanical problem no medical therapy is documented in the literature. Associated tracheomalacia and bronchial inflammation has been cited in some cases. In view of the compression being of a distal segmental (left lower lobe) bronchus and not of the proximal lobar bronchus, the medical therapy with ICS-LABA may have caused symptomatic improvement in our case by reducing the bronchial inflammation.

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